

## **Remarks/Arguments**

Claims 1-9 are pending in the application.

Claim 5 has been amended to delete the term "suitable" for clarification purposes. No new matter has been added. Applicants submit that this amendment requires only a cursory review and does not raise new issues requiring a further search. Accordingly, entry of the clarifying amendment is respectfully requested.

Claims 5 and 8 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 3,554,792 ("Johnson"). Claims 1, 4 and 9 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,743,275 ("Cobett"). Claims 1, 3, 4 and 9 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,293,994 ("Field"). Claims 2 and 5-8 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Field and further in view of U.S. Patent No. 4,728,537 ("Allen"). Applicants respectfully traverse these rejections and submit that the pending claims are patentable over these cited references for at least the reasons set forth below.

### **Response to Section 102(b) Rejection based on Johnson**

The Office rejects independent claim 5 as anticipated by Johnson. Specifically, in the Response to Arguments section of the Office Action, at page 4, the Office maintains the rejection of independent claim 5 by alleging that the recitation "suitable for . . ." is merely an intended use of the claimed binder system. Thus, the Office asserts that this language is not given patentable weight. Moreover, the Office further asserts that "because the composition in Johnson is the same as claimed, it would be capable of performing the same intent." (Office Action, page 4). Applicants respectfully disagree that Johnson anticipates claim 5.

More specifically, claim 5 as amended recites, "[a] binder system for producing iron ore agglomerates." The binder system comprises carboxymethyl cellulose and an alkali metal silicate. Applicants submit that the Office's premise that the preamble recitation "for producing iron ore agglomerates" is merely intended use, however, is improper. According to the Federal Circuit, "[i]f the claim preamble, when read in the

context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." See M.P.E.P. § 2111.02 (citing *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999)). Further, in *Poly-America LP v. GSE Lining Tech. Inc.*, 383 F.3d 1303, 1310, 72 USPQ2d 1685, 1689 (Fed. Cir. 2004), the court stated that "a '[r]eview of the entirety of the '047 patent reveals that the preamble language . . . does not state a purpose or an intended use of the invention, but rather discloses a fundamental characteristic of the claimed invention that is properly construed as a limitation of the claim.'" Here, claim 5 is not merely directed to an intended use, but defines a fundamental characteristic of the claimed invention, i.e. that the claimed binder system is required for producing iron ore agglomerates. This distinguishes the claimed composition from Johnson, which is not capable of performing the same intent, as the Office alleges.

As noted in Applicants' previously filed response, Johnson discloses a welding electrode and a coating therefore which coating contains about 10 – 15 parts by weight of a binder consisting of an alkali metal silicate and about 0.5 parts by weight of sodium carboxymethyl cellulose. (See Johnson, abstract). Consequently, the amount of CMC in the binder is between and 3.33 and 5 wt% and the amount of alkali metal silicate in the binder is between 95 and 96.66 wt%. Contrary to the Office's assertions, Applicants submit that the binder disclosed in Johnson is not disclosed or suggested as being capable of producing iron ore agglomerates. Rather, the binder disclosed in Johnson would lead to excessive clustering and severe deformation instead of controlled growth that is needed to produce an agglomerate.

As set forth in the M.P.E.P. § 2131, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Here, Johnson fails to disclose Applicants' identical invention and is also not capable of performing the same intent. Moreover, claim 5 identifies a patentable distinction over Johnson by setting forth a fundamental characteristic of the claimed invention. Therefore, Applicants

submit that claiming percentages or amounts of the respective components of the binder system, as the Office apparently alludes to at page 4 of the Office Action, is not required to define the claimed invention over Johnson.

Accordingly, because Johnson discloses a coating for a welding electrode and not a coating that is capable of producing iron ore, Johnson cannot anticipate claim 5. Moreover, claim 8, which is dependent on claim 5, is also not anticipated by Johnson for at least the same reasons that claim 5 is not anticipated by Johnson. Reconsideration and withdrawal of the rejection of claims 5 and 8 is respectfully requested.

#### **Response to Section 103(a) Rejection based on Cobett**

The Office rejects claims 1, 4 and 9 as obvious over Cobett. In the Response to Arguments section of the Office Action, the Office maintains the rejection stating that "the disclosed amount of sodium silicate incorporates the entire range of at most 10%." (Office Action, page 4). Further, the Office states that "Cobett does not teach any lower limit of alkali metal silicate." (Office Action, page 4). Rather, the Office asserts that nonpreferred embodiments and alternative embodiments constitute prior art, and that disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. (Office Action, page 4). Applicants respectfully disagree that Cobett renders Applicants' invention, as recited in claim 1, obvious.

Specifically, Applicants submit that Cobett, at col. 2, lines 1-3 and claim 1, does not disclose sodium silicate in a range of at most 10%, but rather, the range of at most 20%. Applicants acknowledge that according to the M.P.E.P. § 2144.05, a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness." *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See also *In re Harris*, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005) . . ." According to M.P.E.P. § 2144.05(III), however, "Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range." Here, Applicants

submit that the range as recited in claim 1 is patentably distinguishable over the broader range allegedly disclosed in Cobett for the following reasons.

Applicants have included in their specification examples that evidence the improved performance of Applicants' claimed process utilizing the claimed binder system over processes utilizing binder systems above 0.08, such as disclosed in Cobett. Specifically, as shown in Table 1, Comparative Example 2 includes sodium silicate in an amount of 0.2%, which is above Applicants' claimed range of 0.0001 to 0.07%, but falls within the range disclosed in Cobett. Examples 1-4, as shown in Table 1, include sodium silicate in amounts of 0.03, 0.05, 0.06 and 0.08, respectively. Each of the Comparative Examples and Examples were made by the same process. Based on the test results identified in Table 2, "the pellets of Examples 1-4 show an improvement in wet drop number and only a slight increase in deformation, whereas the pellets of Comparative Example 2 reveal a significantly higher deformation and wet drop number." (Specification, at page 11, lines 8-11). Consequently, as discussed in Applicants' specification, the pellets of Comparative Example 2 are deformed to a higher extent in the steel making process, rendering the process for preparing fired pellets less efficient than the process of the present invention. (Specification, at page 11, lines 11-14). Moreover, the green pellets of Examples 2-4 are smooth and non-sticking, whereas the green pellets of Comparative Example 2 are smooth and sticky. This characteristic undesirably causes clustering of the pellets during processing.

Consequently, Applicants have identified generally that a high amount of alkali metal silicate, i.e. above 0.08%, is undesirable, because silicates can slow down the reduction process in steel making operations by blocking the pathways the reducing gases use to permeate the pellet, which leads to an increase in energy costs. (See e.g. col. page 1, lines 5-19). Furthermore, the use of such high amounts of alkali metal silicate results in green pellets that have a high tendency to deform, which in turn may lead to pellets of different size and shape, resulting in an inefficient process for preparing fired pellets. *Id.* In contrast, Cobett does not attach any significance to its disclosed sodium silicate range other than to state that it can be as high as 20%. Thus, where Applicants have identified a particular range for their sodium silicate for their

process that provides unexpected, improved results, Cobett broadly discloses a range that, as Applicants have shown, includes a very large portion, i.e. above 0.08% to 20%, that is undesirable and results in poorer performance. Accordingly, Applicants submit although Cobett's disclosed range may overlap Applicants' claimed range, nowhere in Cobett are there specific examples or any other indication or suggestion that the amount of sodium silicate in the range claimed by Applicant would have been expected to perform any better than the portion of Cobett's range that is outside the scope of Applicants' claimed range.

Applicants submit, therefore, that independent claim 1 and claims 4 and 9, which depend from claim 1, are patentable over Cobett.

Furthermore, regarding claim 9, the Office asserts that Cobett discloses that water is an inorganic binder, at col. 2, line 22. Applicants respectfully disagree, as Cobett provides no basis for the Office's assertion that water is an inorganic binder. At col. 2, lines 17-21, Cobett discloses that its "silicate should be used in the form of an aqueous solution . . ." Thus, water is not used as a binder, but rather it is included as a solvent. Furthermore, Cobett discloses that

[c]uring of the briquettes is believed to proceed by causing the alkali metal silicate solution to form a gel, which contracts and forces the water out of the ferrous material/silicate mixture, thereby hardening the final product. Thus, during curing of the briquettes, the moisture in the alkaline metal silicate solution is given up to the atmosphere. (Col. 2, lines 26-31).

Accordingly, water cannot be considered a binder where it is, in fact, not only a solvent, but where the curing and hardening of the final product occurs when the water is removed and given up to the atmosphere. Consequently, the Office's basis for rejecting claim 9 is improper and must be withdrawn for this additional reason as well.

#### **Response to Section 103(a) Rejection based on Field**

The Office rejects claims 1, 3, 4 and 9 as obvious over Field. In the Response to Applicants' Arguments section of the Office Action, the Office merely states that "a

*prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one of ordinary skill in the art would have expected them to have the same properties." (Office Action, page 5). Applicants respectfully request reconsideration of Applicants' previously filed response, as the Office has merely restated its conclusion of obviousness without any further explanation. According to M.P.E.P. § 707.07(f), "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." (emphasis added). Applicants submit that the record should be clarified by the Office to at least allow the Applicants to have a clearer understanding as to the Office's grounds for maintaining the rejection and to clarify the issues for purposes of Appeal. In the absence of such explanation, Applicants submit that the rejection has not been properly made and that the rejection should be withdrawn as improper.

Notwithstanding, according to the Office's rejection, Field teaches making fired mineral pellets in which the pellets include alkali metal silicate in an amount of above 0.08%, as well as cellulosic polymers. According to Field, the binder comprises alkali metal silicate and the amount which is used is defined as "a dry weight amount which is either (a) above 0.13% based on moist mix or (b) above 0.08% based on moist mix and at least three times the dry weight of the substantially water soluble organic polymer." (emphasis added). (See Field, col. 1, lines 59-65). Contrary to the Office's assertions, Applicants submit that the range as recited in claim 1 is patentably distinguishable over Field.

As argued above with respect to Cobett, Applicants have identified that amounts of alkali metal silicate above 0.08% are undesirable for several reasons. In contrast, Applicants' process, which includes alkali metal silicate present in an amount of between 0.0001 and 0.07 percent by weight, provides unexpected improvements in performance, e.g. in wet drop number and deformation characteristics. Further, Applicants' invention leads to iron ore agglomerates with increased cold compression strength, preheat strength, and dry crush strength relative to the use of conventional binder systems comprising the same binder. In contrast, the conventional state of the

art binder systems, such as Field (and Cobett), promote the use of a relatively larger amount of alkali metal silicate, and such systems exhibit a significant increase in the degree of deformation, which is undesirable. Field, like Cobett, does not disclose or suggest that a process that includes agglomerating fine iron ore particles in the presence of alkali metal silicate below 0.08% results in such improved properties. Rather, Field prefers higher amounts, such as at least 0.15%, at least 0.18% and at least 0.2%, suggesting 0.7% and 0.5% are often convenient upper limits. (Field, at col. 2, lines 18-23). As evidenced in Applicants' Examples, however, such higher amounts have been found to result in significantly poorer performance. Accordingly, the results achieved by Applicants' invention, as recited in claim 1, are unexpected based on the disclosure of Field.

Applicants submit, therefore, that independent claim 1 and claims 3, 4 and 9, which depend from claim 1, are patentable over Field.

**Response to Section 103(a) Rejection based on Field and further in view of Allen**

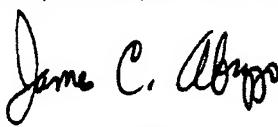
The Office rejects claims 2 and 5-8 as obvious over Field and further in view of Allen. Applicants respectfully request reconsideration of Applicants' arguments filed in their Amendment dated November 3, 2008 for the reason that the Office has failed to respond to Applicants' arguments or identify why the rejection is maintained. Consequently, Applicants' response to the rejection does not appear to have been properly considered and no explanation is provided as to why Applicants' arguments were insufficient to overcome the rejection. As noted previously, according to M.P.E.P. § 707.07(f), "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." (emphasis added). Applicants submit that the record should be clarified by the Office to at least allow the Applicants to have a clearer understanding as to the Office's grounds for maintaining the rejection and to clarify the issues for purposes of Appeal. In the absence of such explanation, Applicants submit that the rejection has not been properly made and that the rejection should be withdrawn as improper. For at least this reason and the reasons set forth in Applicants' Amendment

filed November 3, 2009, claims 2 and 5-8 are patentable over Field in combination with Allen.

### **Conclusion**

In view of the amendments and arguments set forth above, Applicants submit that the pending application is in condition for allowance. Notice to this effect is earnestly solicited.

Respectfully submitted,



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